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SYSTEMATICS OF THE GENERA OF EPYRINAE WITH RAMOSE MALE ANTENNAE (HYMENOPTERA: BETHYLIDAE)

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Abstract.—The genera of Epyrinae with ramose antennae in the male are reviewed. *Calyoza* Westwood, 1837, *Paracalyoza* Cameron, 1909, *Calyozella* Enderlein, 1920, and *Pseudocalyoza* Turner, 1915, are new synonyms of *Epyris* Westwood, 1832. Species described in the first three genera constitute the Staphylinoides species group; the last genus forms the Subramosus species group. *Calyozina* Enderlein, 1912, is a discrete genus. A neotype is described for *Calyoza staphylinoides* Hope, the type-species of the genus.

Epyris ashmeadi (Enderlein) and *E. ramosus* (Meunier) are **new synonyms** of *E. staphylinoides* (Hope). *Epyris niger* (Kieffer), *E. flavipennis* (Turner) and *E. bryanti* (Turner) are **new synonyms** of *E. hirtipennis* (Cameron). ***Epyris puduma*** Krombein, n. sp., is described from Sri Lanka. ***Epyris sumatrensis*** Krombein, n. name, is proposed for *E. flavipennis* (Enderlein), 1920, not *E. flavipennis* (Turner), 1914. *Calyozina ramicornis* Enderlein is redescribed and figured.

Key Words: Bethylid wasps, *Epyris,* ramose male antennae, systematics, new species

Males with ramose antennae are rarities among species of aculeate Hymenoptera, so it is not surprising that several specialists on Bethylidae proposed generic names for some species with such unusual appendages. The relatively few known females exhibit no such sexual characters.

Westwood (*in* Hope 1837) was the first to propose a genus for such a male, *Calyoza,* based on a specimen preserved in gum. It is not known whether the specimen was recent or fossilized. Cameron (1909), Enderlein (1912, 1920), and Turner (1915) proposed additional genera, their names formed by adding a prefix or suffix to the name *Calyoza.*

Based on the descriptions, I suspected that some of these genera might be synonyms of *Calyoza.* I borrowed the type-species insofar as available, and the results of my examination appear below.

Measurements and terminology are as in Evans (1964) as modified by him later (1969). The abbreviations used in the descriptions are as follows:

LH—length of head from middle of clypeal margin to midpoint of vertex;
WH—width of head including eyes;
WF—width of front (i.e., least interocular distance);
HE—height of eye measured in lateral view;
EV—distance from top of eye to crest of vertex in lateral view;
WOT—width of ocellar triangle including posterior ocelli;
OOL—ocello-ocular line, least distance between posterior ocellus and inner eye margin;
LT—length of thorax, collar excluded, from anterior margin of pronotal disk to posterior end of propodeum.

Epyris Westwood, 1832

Calyoza Westwood *in* Hope, 1837: 56. Type-species by monotypy: *C. staphylinoides* Hope. **New Synonymy.**

Paracalyoza Cameron, 1909: 377. Type-species by monotypy: *P. hirtipennis* Cameron. **New Synonymy.**

Pseudocalyoza Turner, 1915: 298. Type-species by monotypy: *P. subramosa* Turner. **New Synonymy.**

Calyozella Enderlein, 1920: 24. Type-species by original designation, *C. flavipennis* Enderlein. **New Synonymy.**

A study of type or other material of the four genus-level taxa listed above shows them to be synonyms of *Epyris* as redefined by Evans (1964, 1969). Their names should be added to the generic synonymy listed by Evans. The males described in *Calyoza, Paracalyoza,* and *Calyozella* are unique in *Epyris* because of the ramose antennae. They constitute the Staphylinoides species group of *Epyris.* They are similar to males of the New World Dodecatomus species group in that the third antennal segment is extremely short, forming a ring-joint (Fig. 2), closely joined to the base of the fourth segment, and in having the scutellar pits connected by a narrow, impressed line (Figs. 3, 4, 11).

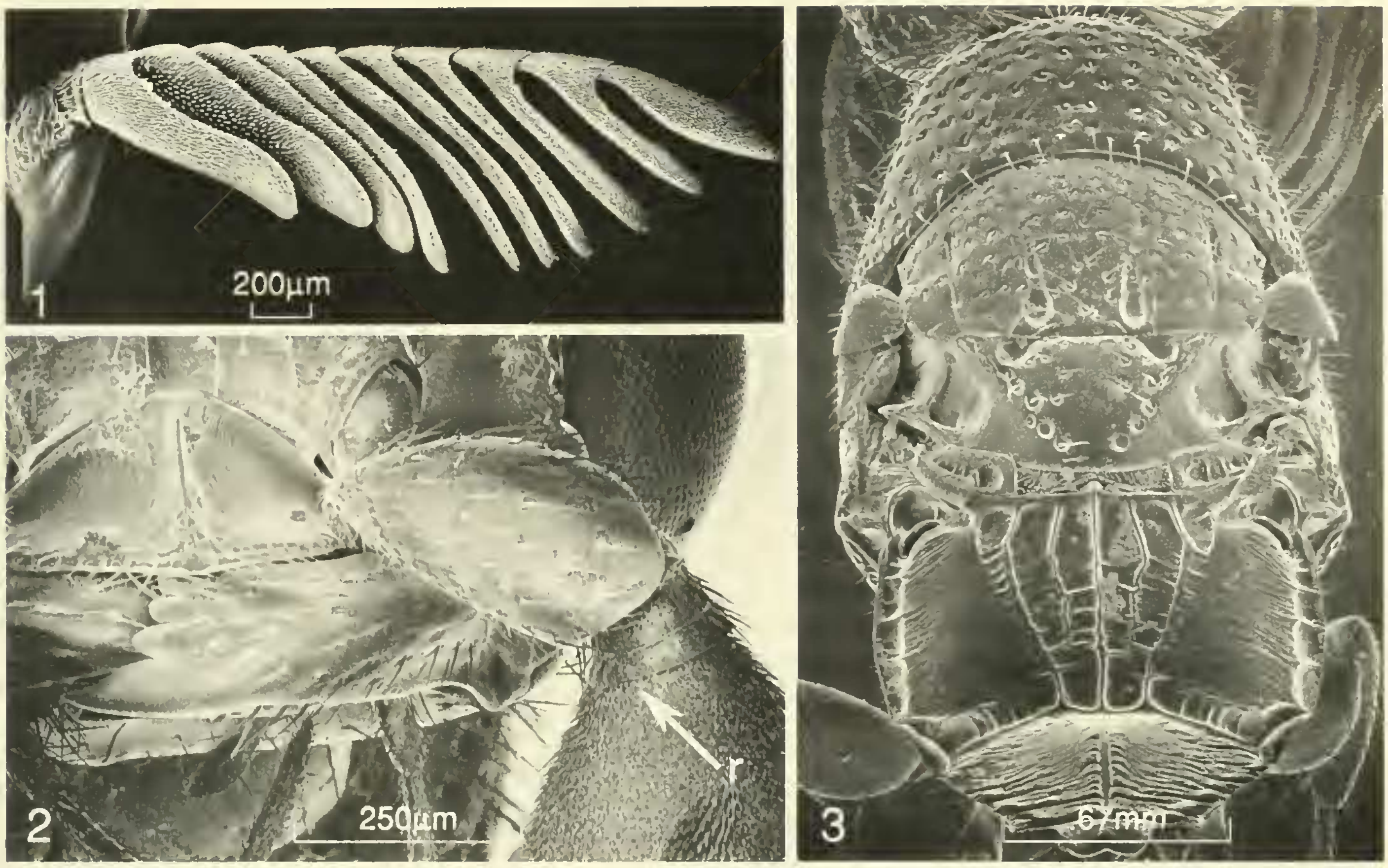
Cameron separated *Paracalyoza* from *Calyoza* on the basis of the basal and transverse median veins being interstitial. These veins, however, are interstitial in *staphylinoides,* and Cameron's error may be traced to inaccuracy in Westwood's illustration (1874, fig. 1).

Enderlein separated *Calyozella* on the basis that the ramus of the 12th antennal segment is shorter or at most as long as the segment itself. (Enderlein called this the 11th segment; he overlooked the tiny ring joint, the third segment.) The unique holotype of *Calyozella flavipennis* from Soekaranda, Sumatra, was in the collection of the Stettin Zoological Museum, and should now be in the Warsaw Zoological Museum. I have been unable to borrow it. Enderlein stated that the ramus of the 12th was shorter than the segment. The unique holotype of *Calyozella sauteri* Enderlein, the other species originally included in the genus, is from Taihorin, Taiwan, and was available on loan from Eberswalde. The 12th segment and its ramus are of equal length. I find no substantive characters on which to separate *Calyoza* and *Calyozella,* and consider that both species of the latter genus are also members of the Staphylinoides species group in *Epyris.* The relative length of the 12th segment and its ramus are variable in the Staphylinoides species group, ranging from a ramus of 0.7 × the length of the segment in an unidentified African species, to 1.4 × in the specimen described below as the neotype of *staphylinoides* Hope.

Pseudocalyoza Turner is also a synonym of *Epyris* but belongs to a different species group than the Staphylinoides group. It is discussed in more detail subsequently.

Staphylinoides Species-group
Figs. 1–16

Large species, forewing length 3.5–5.2 mm in male, 4.3–5.6 mm in female; body black, abdomen sometimes red apically or entirely. Mandibles of male slender, 3–4 dentate (Fig. 2), those of female stout, 4–5 dentate (Fig. 9), and lower margin with large, blunt, subapical tooth (Fig. 10); anterior margin of male clypeus angulate medially (Fig. 2), about 110°–135°, that of female gently arcuate, occasionally slightly concave in middle (Figs. 9, 13); eyes large, glabrous; ocelli in a compact triangle, front angle 80°–120° in male, 65°–90° in female; male antennae unusual in that segments 4–12 have a subapical ramus that is usually longer than length of segment (Figs. 1, 7), segment 3 a ring joint closely consolidated with 4 (Fig. 2, r). Pronotum with smooth contours; scutellar pits well-separated except in *rufiventris* where distance between them is subequal to pit diameter, the pits connected anteriorly by a narrow impressed line (Figs. 3, 4, 11); propodeum with margins carinate,



Figs. 1–3. *Epyris staphylinoides* male, Ukunda, Kenya. 1, antenna, Au-coated specimen at 20 KV. 2, clypeus, mandible, and base of antenna, r = ring joint, uncoated at 3 KV. 3, thoracic dorsum, wings removed, uncoated at 3 KV.

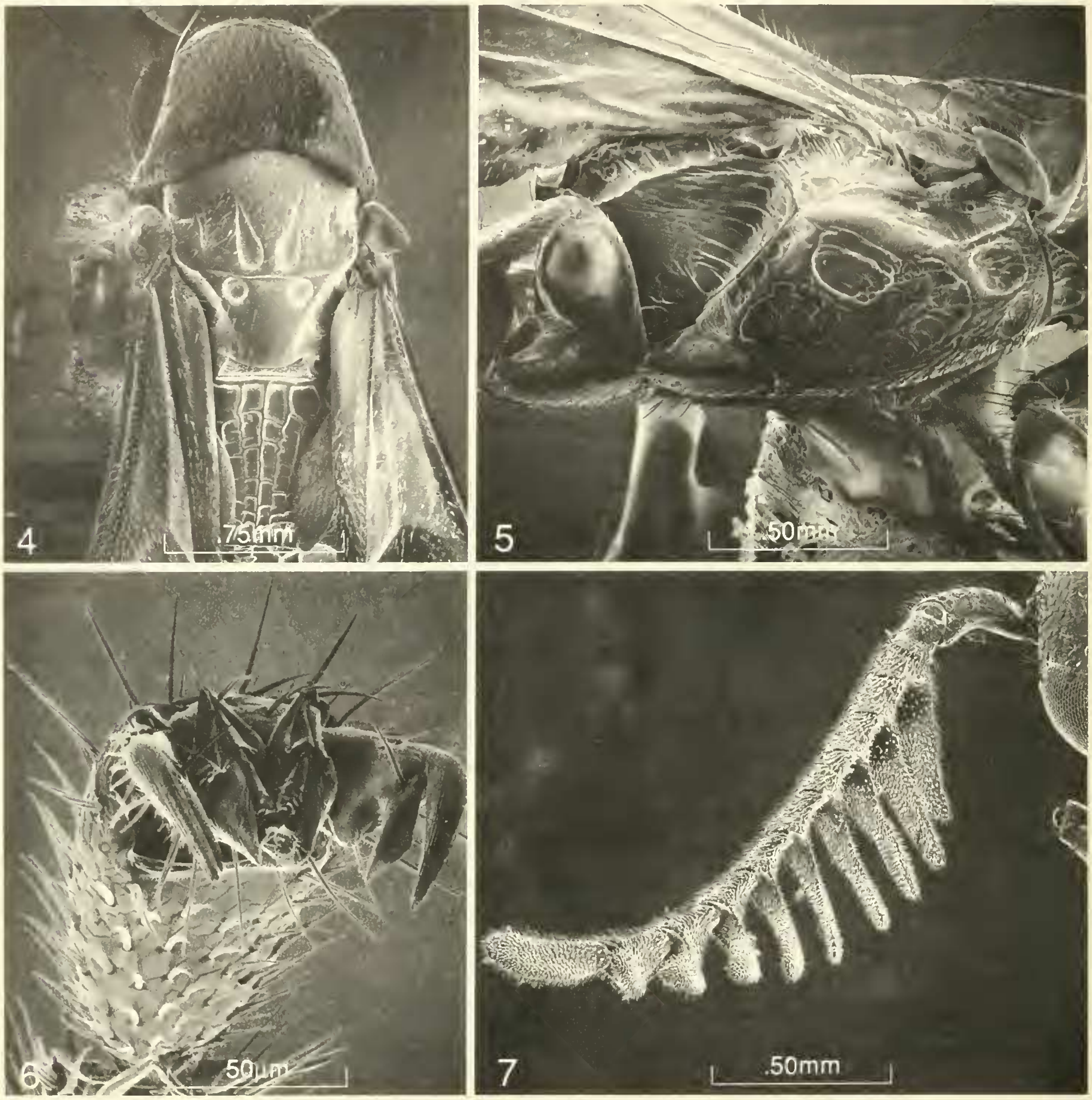
median area with three or five longitudinal carinae (Figs. 3, 4), the median and lateral carinae complete, if with five carinae, the intermediate pair complete or nearly so; mesopleuron with fovea not divided into upper and lower foveae (Figs. 5, 10), except in an undescribed species from the Philippines. Female midtibiae with 2–3 rows of close, short spines; tarsal claw with two teeth, outer longer and more slender, inner short and blunt (Figs. 6, 12, 14). Male genitalia with parameres slender, armed apically with 2–3 long setae; cuspides slender and biramous.

The Staphylinoides species group is similar to the New World Dodecatomus species group in having the first flagellar segment of the male antenna reduced to a narrow ring joint, closely appressed to the base of the second segment. Males of the Dodecatomus group differ from those of the Staphylinoides group in lacking ramose antennae. Females of the Dodecatomus group have the mandible without a subapical tooth on lower margin, the clypeus angulate or subangulate medially, and the hindtibiae have only a few spines, whereas females of the Staphylinoides group have a subapical mandibular tooth, and the midtibiae have 2–3 rows of close, short spines. Other undescribed species groups of Old World *Epyris* have males with the third antennal segment a ring joint, but they lack a ramose antenna. The relationships between these various Old World groups and the New World Dodecatomus group will need consideration when the Old World Epyrinae are revised.

Epyris staphylinoides **(Hope),**
NEW COMBINATION
Figs. 1–3

Calyoza staphylinoides Hope, 1837: 56, fig. 11 (♂).—Westwood, 1874: 157 (♂, ♀; Natal).

Calyoza Ashmeadi Enderlein, 1901: 214–215 (♂, 2♀; Nord-Kamerun, Johann-Al-

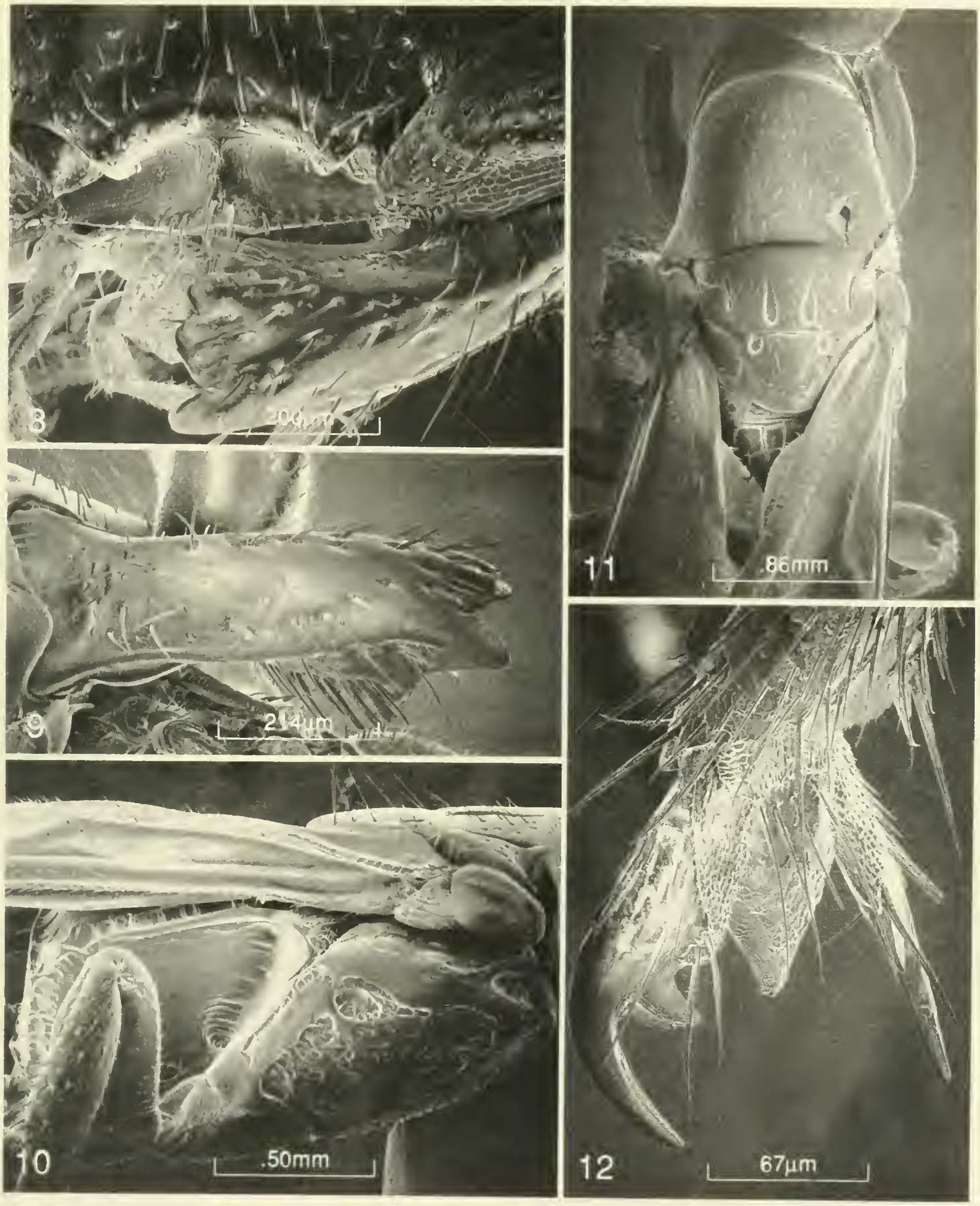


Figs. 4–7. *Epyris puduma* male, uncoated at 3 KV. 4, thoracic dorsum. 5, mesopleuron and anterolateral propodeum. 6, hindtarsal claw. 7, antenna, terminal segments twisted.

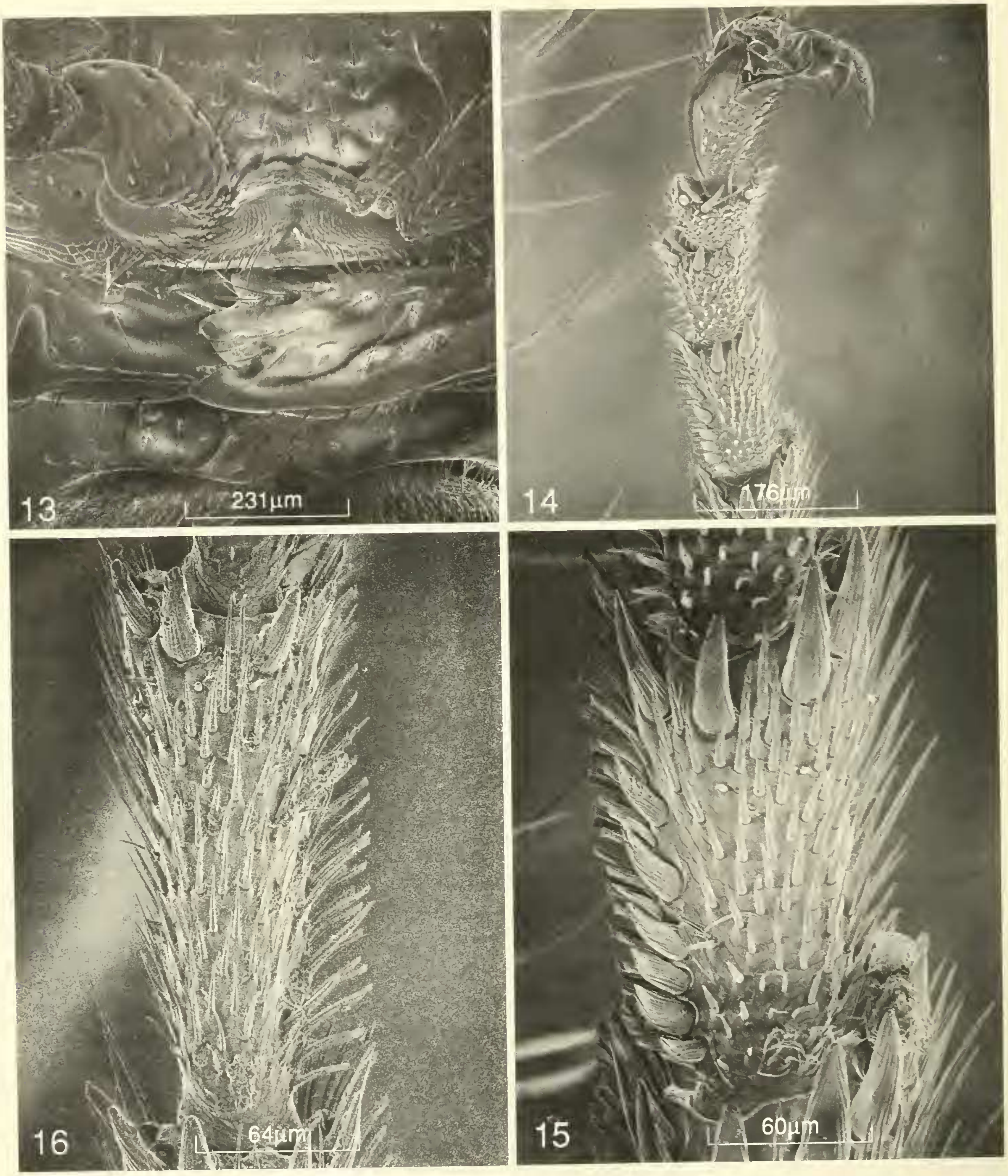
brechtshöhe; syntypes in Museum für Naturkunde der Humboldt-Universität, Berlin). New Synonymy.

Calyoza ramosa Meunier, 1906: 59–60 (♂; Zanzibar; unique holotype in recent or fossil copal; depository unknown; lost?). New Synonymy.

Hope (1837) described a dozen species of insects, primarily Coleoptera, that were trapped in resin from trees belonging to the Dipterocarpaceae of the Old World tropics. The specimens were in the collection of W. Strong, a maker of varnishes in London. Some of the specimens were in resin from *Vateria indica* of Malabar, India, known as gum animé. Hope cited "E Resino Animé" for some species, but not for others including the *Calyoza*. Hope mentioned a Madagascan dipterocarp as providing resin in abundance in which he found insects embedded. From this it might be inferred that



Figs. 8–12. *Epyris puduma* female, uncoated at 3 KV. 8, clypeus and mandible. 9, mandible, frontal aspect, note subapical tooth on lower margin. 10, mesopleuron and anterolateral propodeum. 11, thoracic dorsum. 12, hindtarsal claws.



Figs. 13–15. *Epyris hirtipennis* female, Brunei, uncoated at 3 KV. 13, clypeus and mandible. 14, hindtarsus. 15, second hindtarsal segment. Fig. 16, *Epyris puduma* female, uncoated at 3 KV, second hindtarsal segment.

the species not characterized as being from gum animé came from resin from other sources and localities.

Hope purchased Strong's collection of insects in amber and gum animé in 1837. It was deposited in the University Museum, Oxford in the early 1860s but it was not accompanied by a list of specimens. C. O'Toole, collections manager at the Museum made a thorough search for the unique type of *staphylinoides,* and was unable to find it. He examined 210 pieces of reasonably polished, clear gum aminé in the collection, and other pieces that are on public display. He added: "In the 1960's, a young preparator, no longer with us, was given access to the Strong collection to practice grinding and polishing amber. This may of course be a source of perturbation and loss from the collection. I have traced all the extant material which passed through his hands and cannot match it with the illustrations [i.e., of *staphylinoides*]. I think I have covered all the exits now and I think that we must conclude that either the type of *Calyoza staphylinoides* never reached Oxford or that it suffered during the indifferent treatment the collection was subjected to."

Westwood (1874) redescribed the species from a pair from Port Natal, South Africa, and stated that he had ". . . no hesitation in giving [it, i.e., the male] as identical . . ." with Hope's unique type. This suggests that Westwood might have compared the pinned male with the type. I am designating this male as the neotype of *Calyoza staphylinoides* Hope.

The syntype series of *ashmeadi* consists of a male and two females, one of the latter now lacking an abdomen. The male bears a red label, "Type ♂," and the female lacking an abdomen bears a red label, "Type ♀." The other female bears no type label, but I presume it to be a syntype for it is mentioned in the description. I have designated the male as the lectotype. The species is clearly a synonym of *staphylinoides,* differing only in OOL being 1.6 × WOT in the male, and 1.8 × WOT in the female. The mandibular dentition in both sexes is the same as in *staphylinoides.*

It is probable that Meunier's unique type of *ramosa* is no longer in existence. The specimen is not in any of the institutes of the University of Bonn which house Meunier's collection of recent Diptera and Hymenoptera, and the collection of fossil insects. Meunier described this and two species of Diptera from specimens in copal in the collection of J. Evers, Altona-Bahrenfeld, Hamburg. The specimens probably were returned to Evers, and destroyed during World War II.

Meunier does not mention coloration but his description otherwise is not inconsistent with that of *staphylinoides* which could be expected to occur in Zanzibar. Meunier's Fig. 1 of the head is probably inaccurate for it is not symmetrical. Ratios derived from the figure are: WH equal to LH; WF 1.3 × HE and 0.7 × WH; EV 0.7 × HE; OOL 1.4 × WOT on right side, 1.7 × on left; and ocelli with frontal angle of 105°. His Figures 2 and 3 of forewing and tarsal claws are typical of species of the *staphylinoides* group.

The following description of *staphylinoides* will supplement the very brief Latin diagnosis by Westwood (1874). Westwood dissected a mandible and the palpi from the male (his Fig. 1a–c), breaking off most of the clypeus in the process. The front is split along the midline to a small hole that was made when the mandible and palpi were removed. The posterior third of the right side of the propodeum was broken, and was repaired with glue that covers the right side of the sternum, and the mid- and hindcoxae. He also dissected a mandible and palpi from the female (his Fig. 2a–e).

The male bears two labels in Westwood's handwriting. One is green, and is inscribed, "Natal/Guenzius/5/Higgins 1867." C. O'Toole advised me that the specimen was purchased from Higgins, an employee of the entomological dealer Stevens, for 5 shillings, the current equivalent of £ 30. Beneath this label is a white one, "Calyoza/♂/ Westw.Trans Ent S./Thes.Ent.pl.29fl," referring to Westwood's 1837 description and 1874 illustration. The dissected palpi and mandible are glued on a small white rectangle mounted beneath the specimen. The female in the British Museum bears a small green label, "Pt/Natal."

Neotype male.—Length 6.5 mm, forewing 3.9 mm. Black, head and thorax slightly dull, delicately alutaceous, propodeum and abdomen glossy; mandible except basal third and apical teeth, antenna, tegula, inner surface of foretibia at apex, and last three abdominal segments light red; rest of legs dark brown to castaneous. Vestiture of head and thorax sparse, short, suberect, cinereous; flagellar segments with very short, dense, suberect silvery setae. Wings clear, stigma dark brown, forewing veins lighter brown.

Head.—WH 1.1 × LH; WF 1.3 × HE and 0.6 × WH; EV 0.6 × HE; mandible quadridentate (Fig. 2[1]), two inner teeth quite small; eyes slightly protuberant, ocular setae lacking; front with small punctures mostly separated by a puncture's width; ocelli with frontal angle 120°, OOL 0.9 × WOT, posterior pair separated from occiput by nearly 3× their diameter; antenna 13-segmented (Fig. 1), relative lengths of first four segments about 31:4:3:11, segment 3 a ring joint closely joined to 4, 12 half as long as 13; segments 4 through 12 with a subapical ramus beneath each of which is longer than dorsal length of respective segment; ramus of 4 about 3× as long as segment, rami of succeeding segments increasing gradually in length to 7–11 which are 4× as long as respective segments, that of 12 a little less than 2× as long as segment.

Dorsum of thorax (Fig. 3) twice as long as width at pronotal lobe; pronotal disk with punctures somewhat larger than on front, separated by half or more width of puncture; pair of basal pits on scutellum separated by 3× their diameter, connected anteriorly by a narrow, impressed line; propodeal disk 0.6× as long as wide, median enclosure with five longitudinal carinae, middle carina and outer pair stronger and reaching posterior transverse carina, outer pair converging slightly toward apex, middle pair weaker and extending only two-thirds toward apex, areas between carinae with weak transverse carinae, areas laterad of enclosure finely, closely, transversely carinulate.

Female.—Length 7.7 mm, forewing 5.1 mm. Black, the following red: mandible except teeth, antenna, antennal lobe, apex of forefemur, foretibia, all tarsi and last three abdominal segments; tegula, femora and mid- and hindtibiae dark brown. Wings clear, stigma dark brown, forewing veins lighter brown. Vestiture on head and thoracic dorsum, short, subappressed, cinereous.

Head: WH 1.1 × LH; WF 1.7 × HE and 0.7 × WH; EV 0.8 × HE; OOL 1.8 × WOT; front angle of ocelli 90°; first four antennal segments in a ratio of 52:11:10:18, third segment 0.7× as long as wide; mandible quinquedentate, innermost tooth small and truncate, lower margin with large, blunt subapical tooth; front delicately alutaceous, a median groove between antennal tubercles running upward, front with small punctures, those above tubercles separated by about half their diameter, upper front with punctures separated by about twice their width.

Thorax: pronotum delicately alutaceous and punctate like front, 1.4× as wide as long; scutum weakly alutaceous, with a few small punctures laterally, notauli complete, wider posteriorly; scutellar pits narrow, elliptical, oblique, separated from each other by 10× their width, connected anteriorly by a narrow, impressed line; propodeal disk 1.4× as wide as long, median enclosure with five carinae, intermediate pair not quite reaching apex, areas between carinae with close, transverse rugulae; forefemur 2.2× as long as wide; tarsal claw strongly curved, bifid, inner ray short and stout.

Variation.—I collected ten males, 23–25 Jan. 1968, in a narrow strip of jungle between the beach and coastal road 20 mi S of Mombasa, Kenya, near Ukunda. The specimens agree well with the lectotype in

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[1] Figs. 1–3, cited in this description, are from a male from Ukunda, Kenya, that was compared with the neotype.

sculpture but differ as follows: Length 5.5–6.0 mm; only last two abdominal segments red except one having the apex of fifth red; WH 1.1 × LH; WF 1.4 × HE and 0.6 × WH; OOL 1.0–1.1 × WOT; EV 0.6 × HE; apex of clypeus angulate medially at about 135°; ratio of length of first four antennal segments 35:5:5:12 to 35:6:6:13; and ocelli with frontal angle of 115°–120°.

Epyris puduma Krombein, New Species

Figs. 4–12, 16

Male.—Length 6.0 mm, forewing 3.5 mm. Black, mandible, antenna, tegula and legs light red, except apex of mandible and of last antennal segment darker, and forecoxa dark brown. Vestiture of head and thorax sparse, short, suberect, cinereous. Wings with a slight yellowish cast, stigma dark brown, veins light testaceous except radial darker.

Head: WH equal to LH; WF 1.3 × HE and 0.6 × WH; EV 0.5 × HE; mandible tridentate, innermost tooth rounded; clypeus angulate medially at about 110°; front delicately alutacous, with small punctures mostly separated by 1–2× width of a puncture; ocelli with frontal angle about 95°, OOL 1.1 × WOT, posterior pair separated from occiput by 1.8× an ocellar diameter; antenna (Fig. 7[2]) relative length of first four antennal segments about 25:5:5:10, segment 3 half as long as wide.

Thoracic dorsum (Fig. 4), 1.9× as long as width at pronotal lobes; pronotal disk 2.2× as wide as long, with small punctures slightly closer than on front; scutellar pits subcircular, separated by about twice the diameter of pit; propodeal disk 0.7× as long as basal width, enclosure with five complete longitudinal carinae, areas between carinae with close, transverse rugulae, areas laterad of enclosure with numerous fine, oblique carinulae; mesopleuron (Fig. 5); tarsal claw (Fig. 6) strongly curved, bifid, inner ray stout and almost as long as outer.

Female.—Length 7.2 mm, forewing 4.3 mm. Coloration and wings as in male. Vestiture sparser, fine, short, suberect and cinereous on thoracic dorsum and mesopleuron, that on head mostly abraded, propodeum bare, abdomen with very sparse, short, fine, suberect to subdecumbent setae, present only laterally.

Head: WH 1.1 × LH; WF 1.4 × HE and 0.7 × WH; OOL 1.9 × WOT; apical margin of clypeus (Fig. 8) broadly rounded, slightly concave in middle; front angle of ocelli about 65°; first four antennal segments in a ratio of 49:9:10:14, third segment 0.7× as long as wide; mandible (Fig. 8) quinquedentate, innermost tooth small and truncate, lower margin with a large, blunt subapical tooth (Fig. 9); front highly polished, with a short median groove running upward from between antennal tubercles, punctures small, mostly separated by two or more times the diameter of a puncture.

Dorsum of thorax (Fig. 11); pronotum 1.6× as wide as long, polished, weakly alutaceous only at extreme base, punctures as on front; scutum delicately alutaceous, punctures small, closer in middle than laterally, notauli complete, linear on anterior third, widening posteriorly; scutellar pits small, subcircular, separated from each other by 3.7× their diameter; mesopleuron (Fig. 10); propodeal disk 1.3× as wide as long, median enclosure with seven carinae, the three median carinae and lateral carinae complete, the third pair not reaching base, areas between carinae with close, transverse rugulae; forefemur 1.9× as long as wide; first and second hindtarsal segments (Fig. 16) lacking a row of close-set, stout, fluted, conical setae on posterior edge; tarsal claw (Fig. 12) as in male but inner ray only half as long as outer.

Type material.—Holotype ♂, USNM; Sri Lanka, Rat[napura] Dis[trict], 2 mi S of Weddagala, Sinharaja Jungle, 8–12 February 1977, visiting foliage of *Macaranga di-*

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[2] The antennae of both males are curled toward tip, so it is impossible to get a micrograph without some distortion.

gyna, K. V. Krombein. Paratypes, USNM: ♂, same locality but 18–21 June 1976, K.V. Krombein, P. B. & S. Karunaratne; ♀, same locality but 3 mi S of Weddagala, 10–11 February 1977, K. V. Krombein, P. Fernando, D. W. Balasooriya, V. Gunawardane.

Etymology.—The species name is from the Sinhalese noun puduma, surprise, in allusion to the fantastic male antennae in the Staphylinoides group.

Remarks.—The light red appendages and entirely black body distinguish *puduma* from its nearest relative, *staphylinoides* (Hope) from South Africa and Kenya, which has mostly dark legs and the posterior two or three abdominal segments red. The quadridentate mandible of the male, markedly coarser sculpture, and more obtuse ocellar triangle also readily separate *staphylinoides* from *puduma*.

I collected one male visiting a pair of extrafloral nectaries on a cordate leaf of kenda, *Macaranga digyna* (Roxburgh), a euphorbiaceous shrub about 3 m high. The nectaries are located on the upper surface of the leaf near the attachment of the petiole on the lower surface.

Epyris hirtipennis (Cameron), NEW COMBINATION

Figs. 13–15

Paracalyoza hirtipennis Cameron, 1909: 377 (♂, ♀; Kuching, Borneo; type series in BM(NH)).—Turner, 1915: 299 (synonymized *Calyozina flavipennis* Turner).

Calyoza nigra Kieffer, 1922: 79–80 (♂; Puerto Princesa, Palawan; syntypes in Kieffer collection, presumably destroyed). NEW SYNONYMY.

Calyozina flavipennis Turner, 1914: 245–246 (♂; Mt. Matang, Sarawak, 3000 ft; unique holotype in BM(NH)).

Parepyris bryanti Turner, 1928: 133–134 (♀; Mt. Matang, Sarawak, 1000 ft; unique holotype in BM(NH)). NEW SYNONYMY.

Cameron's syntype series of *hirtipennis* consisted of a single pair. He labeled both specimens as "Type." I am designating the male as the Lectotype. It bears the following labels from the top: a red-bordered disk bearing a printed "Type" in red; a label bearing a handwritten "J.Hewitt" and a printed "Kuching"; a third handwritten label, "J.10"; a printed label, "P.Cameron Coll/1914-110"; and a label in Cameron's hand, "Paracalyoza/hirtipennis/Cam. Type/ Borneo." The female is in poor condition, some characters of the thoracic dorsum are obscured by the pin and matting of the wings. A second male of *hirtipennis* from Kuching in BM(NH) bears a manuscript name and "Type" in Cameron's handwriting.

Kieffer described *nigra* from at least two specimens from C. F. Baker's collecting in the Philippines, because he gives the length as 4.5–8 mm. Baker's personal collection was donated to the Smithsonian, but there are no "*Calyoza*" from Palawan in it. There are series of two distinctive new species of the Staphylinoides group from other islands in the Philippines, but no specimens agreeing with the description of *nigra*. Most of Kieffer's collection was destroyed during World War I, but a few specimens are in the Paris Museum; however, none of these is labeled *Calyoza nigra*. The original description of *nigra* agrees very well with fresh males of *hirtipennis* from Borneo, particularly in the sculpture and coloration of the wings. Southwestern Palawan is separated from Borneo to the southwest by some 150 miles across shallow Balabac Strait. It is reasonable to assume that the two areas share some faunal elements, so I place *nigra* as a synonym of *hirtipennis*.

Turner's unique male holotype of *flavipennis* is clearly synonymous with *hirtipennis* as Turner realized subsequently (1915).

The unique holotype of *bryanti* Turner falls within the range of variation to be expected in larger females.

In addition to the material listed above, I have examined a series of six males and one female BM(NH) bearing the following labels: "BRUNEI:Labi/Mixed dipterocarp/forest.200m./viii–ix.1979 Gauld."

The wings of fresh material have a distinct yellowish tinge, the stigma and veins are yellow, and the male antennal flagella range from being dark brown to having the six apical segments mostly reddish.

Characters not noted in the original descriptions of *hirtipennis* and *flavipennis* males are as follows: Length 6.1–6.7 mm, forewing 4.1–4.4 mm; WH 1.0 × LH; WF 1.3–1.4 × HE and 0.7 × WH; EV 0.4–0.6 × HE; OOL 1.2–1.5 × WOT; clypeus angulate medially at about 110°; front angle of ocelli 80°–85°; first four antennal segments in a ratio ranging from 30:5:3:11 to 35:7:5:15, third segment 0.4–0.5× as long as wide; mandible tridentate; scutellar pits circular, separated by twice their width; upper mesopleural fovea subcircular, moderately large, lower fovea an oblique, linear, crenulate groove along lower margin; propodeal disk 1.6× as wide as long, median enclosed area with five carinae, lateral pair converging toward and reaching apical carina, separated at apex by half the distance between them at base, intermediate pair weaker, not reaching apex of disk.

These additional descriptive notes of the female are based on the three specimens examined. Where two measurements or ratios are given, the first figure is of the *bryanti* holotype, the second of the *hirtipennis* cotype: Length 9.9 and 7.6 mm, forewing 5.6 and 4.6 mm; head massive, subquadrate to quadrate as viewed from above; clypeus (Fig. 13) with apical margin broadly and slightly rounded; punctures on front somewhat larger and closer on *bryanti*; WH 0.9–1.0 × LH; WF 1.2–1.5 × HE and 0.6 × WH; EV 0.9 × HE; OOL 1.9–2.1 × WOT, front angle of ocelli 80°; first four antennal segments in ratios of 55:10:10:15 and 42:8:11:13, and third segment 0.6–0.7× as long as wide; scutellar pits elliptical, oblique, separated by 3.5× width of pit; mesopleuron as in male but lower fovea not crenulate; propodeal disk of *bryanti* 1.2× as wide as long, median enclosed area with three carinae, only median reaching apex, lateral carinae weaker than median, converging toward apex and separated there by half the distance between them at base, areas between carinae weakly, transversely carinulate; posterior propodeal surface with median carina; forefemur 2.0–2.1× as long as wide; midtibia dorsally with 2–3 rows of close, short spines; hindtarsus (Figs. 14–15), posterior edge of first two segments with a row of close-set, stout, fluted, conical setae in addition to the few similar setae at apices of first four segments; tarsal claw with two teeth, outer longer and slender, inner short and blunt.

Epyris sumatrana (Enderlein), New Combination

Calyoza sumatrana Enderlein, 1917: 396–397 (♂; Sinabong, Sumatra; unique holotype originally in Stettin Zoological Museum).

The description of this species of the *staphylinoides* group suggests that it is close to or a synonym of *hirticornis* (Cameron).

The type of *sumatrana* and of the following species should be in the Institute of Zoology, The Polish Academy of Sciences, (IZ PAS), Warsaw, which houses the types of Braconidae described from the Stettin collection by Enderlein (personal communication, P. M. Marsh). E. Kierych, curator of Hymenoptera, IZ PAS, wrote as follows. "I would like to inform you we have not stored in Museum of IZ PAS any type-specimens of Bethylidae, neither Enderlein's nor any other author's."

Epyris sumatrensis Krombein, New Name

Calyozella flavipennis Enderlein, 1920: 24–25 (♂; Soekaranda, Sumatra; unique holotype originally in Stettin Zoological Museum). Preoccupied in *Epyris* by *flavipennis* (Turner), 1914.

The species appears to be distinct from others of the *staphylinoides* group in having

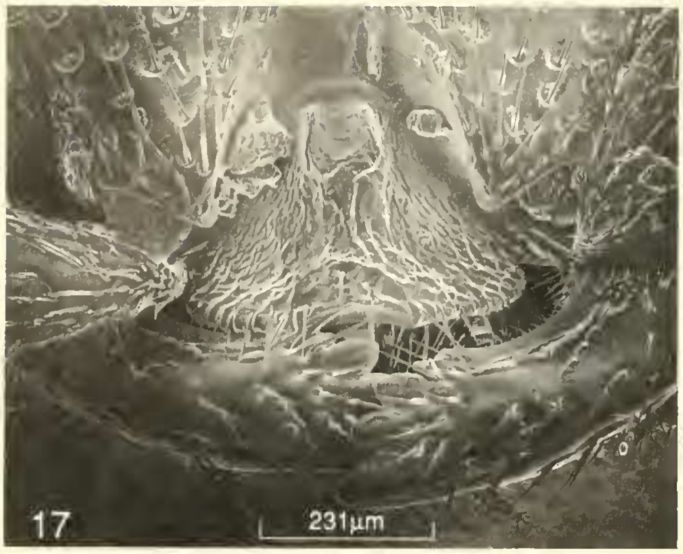

Fig. 17. *Epyris subramosus* female, uncoated at 3 KV, clypeus and mandible.

the antennal rami only slightly longer than the length of the segment. See comment above on *E. sumatrana* concerning the type of *flavipennis*.

Epyris sauteri (Enderlein), New Combination

Calyozella sauteri Enderlein, 1920: 25 (♂; Taihorin, Taiwan; unique holotype in Eberswalde, Germany).

The species is known only from the holotype. The following measurements will supplement Enderlein's description: WH 1.0 × LH; WF 1.4 × HE and 0.6 × WH; EV 0.6 × HE; and OOL 1.3 × WOT. This is the only known male of the *staphylinoides* group in which the head width is less than the length.

Epyris rufiventris (Kieffer), New Combination

Calyoza rufiventris Kieffer, 1907: 288–289 (♂; Mackay, Australia; holotype in BM(NH)).

Characters not noted in the original description are based on the holotype and two topotypic males as follows: Length 8.2–8.4 mm, forewing 4.7–5.2 mm; WH 1.2 × LH; WF 1.4–1.5 × HE and 0.6 × WH; EV 0.4–0.5 × HE; clypeus angulate medially at about 135°; OOL 1.1–1.3 × WOT, front angle of ocelli 105°; first four antennal segments in ratios ranging from 35:5:5:12 to 40:6:5:15, third antennal segment 0.3 × as long as wide; scutellar pits large, circular, separated by 1.1 × their diameter; upper mesopleural fovea large, subelliptical, 1.5 × as long as wide, lower fovea an oblique, linear, crenulate groove along lower margin; propodeal disk 1.5 × as wide as long, enclosed median area tricarinate, twice as wide at base as at apex, disk with a row of large foveae anteriorly, remainder of area closely, transversely rugulose, posterior groove crenulate; posterior surface closely, transversely rugulose, with a median carina; lateral surface closely, longitudinally rugulose.

The female is unknown; the abdomen probably is totally red as in the male.

Epyris subramosus (Turner), New Combination

Fig. 17

Pseudocalyoza subramosa Turner, 1915: 298.

The unique holotype male (BM(NH)) bears a printed label, "Mt. Mlanje/Nyasaland/30-XI-1912/S.A. Neave."

The species is clearly an *Epyris*, and should be considered the only known member of the new Subramosus group. The third antennal segment is a narrow ring joint, but *subramosus* belongs to neither the Staphylinoides group nor the Dodecatomus group both of which also have the narrow ring joint. The male antennae are not ramose, but distinctive in being quite elongate, noticeably flattened beneath, and with the lower apical angle of flagellar segments 2–6 slightly produced. Turner said the male antennae were 12-segmented, but they should be 13-segmented as is normal in *Epyris*. Turner failed to note that the apical segment had been broken off of each antenna; the last four segments of the left hindtarsus are also missing. The male mandible is tridentate but stouter than in the Staphylinoides and Dodecatomus groups.

Other characters of the male not noted in the original description are: Length 8.9 mm, forewing 6.2 mm; WH 1.0 × LH; WF 1.1 × HE and 0.6 × WH; EV 0.6 × HE; OOL 1.6 × WOT, front angle of ocelli 80°; first four antennal segments in a ratio of 21:2:1:16, third segment 0.3× as long as wide; scutellar pits elliptical, oblique, longer than wide, separated by 6× their width; upper mesopleural fovea small, subcircular, lower fovea absent; propodeal disk 1.6× as wide as long; exposed part of paramere very slender, with two long apical setae wavy toward apex, and a shorter straight seta.

The hitherto undescribed female (BM (NH)) bears a printed label, "Mlanje/Nyasaland/8-9-II-1912/S.A. Neave.)" The mandible is quinquedentate, and lacks the subapical tooth on the lower margin that is characteristic of females of the Staphylinoides group.

Female.—Length 8.0 mm, forewing 4.2 mm. Black, mandible, scape, apex of forefemur above, tibiae and tarsi, apex of fourth and last two abdominal segments red; flagellum brown.

Head densely punctate, more coarsely so than in male; WH slightly wider than long (1.02×); WF 1.8 × HE and 0.8 × WH; EV 0.7 × HE; mandible quinquedentate (Fig. 15), upper two teeth small and placed along inner margin somewhat removed from lower, sharper, heavier teeth, lower margin without subapical tooth; clypeus (Fig. 15) with a narrow, slightly concave process at base, apical margin broadly rounded, but shallowly, narrowly concave in middle; OOL 1.4 × WOT, front angle of ocelli 90°; first four antennal segments in a ratio of 40:10:11:12, third segment 0.9× as long as wide.

Thoracic dorsum coarsely punctate, less closely on pronotum than on head and scutum; scutellar pits small, subcircular, separated by about 7× diameter of pit; propodeum dorsally half as long as wide, median area with five carinae, intermediate pair not quite reaching apex; upper fovea of mesopleuron small, lower fovea absent; forefemur 2.3× as long as wide.

Epyris longiceps (Brues)

Calyoza longiceps Brues, 1923: 336–337 (♀; Baltic amber; Zool. Mus., Univ. Königsberg).

Epyris longiceps (Brues), Brues, 1933: 130.

Brues based his original generic assignment on descriptions of female *Calyoza* "... by Kieffer ... combined with those of Ashmead and Westwood" but later (1933) decided that it could not be placed in *Calyoza* after seeing "true" specimens of that genus. After reviewing Brues' description, it appears that he may have assigned it correctly to *Epyris,* but that it cannot be a member of the *staphylinoides* group. Brues stated that the tibiae were "slender and smooth, not at all spinulose," whereas females of the *staphylinoides* group have 2–3 rows of close, short spines on the midtibiae. The unique holotype is presumed lost during World War II.

Calyozina Enderlein

Calyozina Enderlein, 1912: 263. Type-species: *C. ramicornis* Enderlein, by monotypy.

When he described two new Neotropical species of *Calyozina,* Evans (1964) was uncertain whether they were congeneric with *ramicornis* from Taiwan. Enderlein did not state whether the pronotal angles were produced anterolaterally. His type, however, has prominent pronotal angles (Fig. 3), and I believe that Evans' several species are correctly placed in *Calyozina.* The genus is a small, rare one with a disjunct distribution, each of the six species known from a single male only:

ramicornis Enderlein, 1912—Taiwan
amazonica Evans, 1964—Brazil
neotropica Evans, 1964—Panama
mexicana Evans, 1965—Mexico
azurea Evans, 1978—Brazil
caperata Krombein, 1990—Botswana

Turner (1915) incorrectly synonymized *Calyozina* under *Paracalyoza* Cameron, 1909.

Calyozina ramicornis Enderlein
Figs. 18–25

Calyozina ramicornis Enderlein, 1912: 263–264 (♂, Taihorin, Taiwan; unique type in Eberswalde).

Length 5.2 mm, forewing 3.2 mm. Black, head and thorax rather dull from coarse sculpture, the interspaces mostly finely alutaceous, abdomen glossy; antenna, tegula and tarsi red, mandible dark red except at apex, tibiae light brown. Vestiture of head and thorax sparse, suberect, cinereous; flagellar segments with short, moderately dense, erect setae except rami of segments 3–12 with longer, erect, sparser setae about 3× as long as ramus width. Wings clear, stigma light brown, veins testaceous.

Head (Figs. 19, 20): WH equal to LH; WF 1.4 × HE and 0.6 × WH; EV 0.6 × HE; mandible (Fig. 25) quadridentate, three inner teeth subequal, smaller than apical; eyes protuberant, ocular setae sparse, short, no longer than diameter of facet; front and vertex with coarse, shallow, almost confluent pits, interspaces 0.2–0.3 × diameter of pit; ocelli with a frontal angle of about 90°, posterior ocelli separated by a bit less than their diameter from posterior face of vertex; latter abruptly declivous to complete, strong, crenulate occipital carina; antenna (Fig. 18), dorsal length of first four segments about 12:5:5:7, third segment dorsally 1.3× as long as wide; segment 2 roundly protuberant beneath; segments 3–12 each with slender, elongate apical ramus ventrally, rami about 2.5× as long as rest of segment basally, gradually diminishing to about as long at apex, rami ranging from 15× as long as width at base to about 8× at apex; segment 13 1.6× as long as 12.

Thorax (Figs. 20–22); dorsum with length 2.2× as long as greatest width at pronotal lobes, delicately alutaceous; pronotum with anterior face abruptly declivous, disk twice as wide anteriorly as median length, more coarsely and irregularly pitted than head, anterior margin somewhat raised and bluntly angulate laterally; scutum finely alutaceous, parapsidal furrows strong, complete, diverging slightly anteriorly, notauli weakly impressed; scutellum finely alutaceous, margined laterally by a row of small punctures, anteriorly with a pair of deep, large pits that are separated by about half their width, pits not connected by an anterior groove; dorsal propodeal surface 0.8× as long as greatest width, margined posteriorly by a carina, posterolateral angles weakly, bluntly angulate; disk medially with a complete carina, halfway to side with a weaker carina that curves inward posteriorly and does not reach apical carina, areas between median and lateral curved carinae irregularly rugulose, surface laterad with oblique rugulae, at apex with short longitudinal rugulae; lateral surface of pronotum with small, shallow, close pits on upper two-thirds, lower third smooth except for two elongate foveae; mesopleuron with groove above, two moderately large foveae beneath this, and curved carina along ventral margin, area between foveae and ventral carina with shallow, small pits; posterior surface of propodeum rugulosopunctate, lacking median carina; lateral propodeal surface with moderately close, oblique carinules on anterior fourth, narrowly foveolate beneath strong dorsal carina, delicately wrinkled on median half, and with small, close shallow pits posteriorly; forelegs and right hindtarsus missing; tarsal claw (Fig. 24) with small, sharp, erect subbasal tooth; mid- and hindtibiae not spinose; forewing costa not extending beyond stigma.

Abdomen (Fig. 23) with a row of scattered, small, subapical punctures on second to fifth terga; genitalia partially extruded, apex of parameres rounded, with a few submarginal setae.

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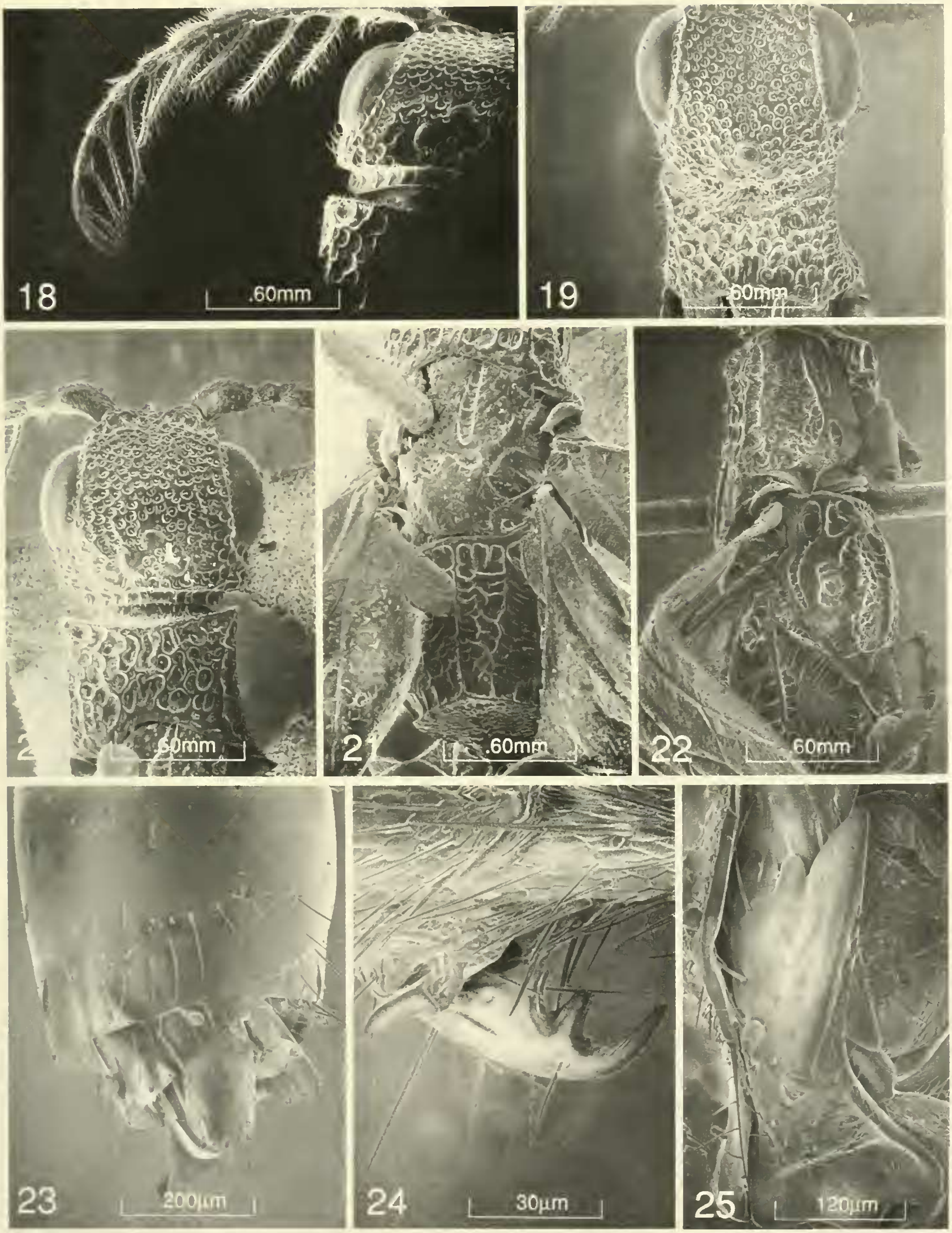

Figs. 18–25. *Calyozina ramicornis* holotype male, uncoated at 3 KV. 18, antenna. 19, front. 20, vertex and dorsum of pronotum. 21, dorsum of scutum, scutellum, metanotum and propodeum. 22, lateral thorax. 23, apex of abdomen, lateral. 24, hindtarsal claw. 25, mandible.

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